Controllable fabrication of TiO_2 nanorod thin films on FTO glass for perovskite solar cells

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This study reports perovskite ($CH_3NH_3PbI_3$)/TiO_2 nanorods (TNRs) based solar cells prepared on fluorine-doped tin oxide (FTO) substrates. The uniform TNR thin film is fabricated by a simple hydrothermal method using an organic-based titanium precursor in a highly acidic solution and acts as electron transport layer (ETL) in the device. Morphology and structure of TNRs were controlled for the optimized solar cell performance. The photovoltaic properties of $CH_3NH_3PbI_3$/TNRs solar cells were investigated by measuring the current density-voltage characteristics and power conversion efficiency.